

Knurr® DCM™ Rack

User Manual



IMPORTANT SAFETY GUIDELINES

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be closely followed during installation and maintenance of this unit. Read all safety instructions before attempting to assemble and install the Knurr DCM. Adhere to all warnings on the unit and in this manual. Follow all instructions.

Read all warnings, cautions and instructions in this before attempting to move, lift, remove packaging from or preparing unit for installation.

This product is designed for commercial / industrial use only. This product is not intended for use with life support or other U.S. FDA designated “critical” devices. Maximum load must not exceed that shown on the Knurr DCM rating label.

Operate this product in a clean, indoor environment that is free of moisture, flammable liquids, gases and corrosive substances.

Ensure that the Knurr DCM has proper ventilation. Never block or insert objects into the ventilation holes or other openings. Maintain a minimum clearance of 12 inches (305mm) in front, rear and top of the Knurr DCM for proper air flow and cooling.

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1.0 INTRODUCTION

The highly versatile Knurr DCM provide an organized, secure, controlled environment in a single system for sensitive electronic equipment.

The Knurr DCM is available in three heights—24U, 42U and 45U (47", 78.5" and 83.9"; 1196mm, 1996mm and 2131mm). Those cabinet heights are available in these widths and depths:

Table 1 Rack dimensions

Rack Size	Dimensions, in (mm)						
	Height			Width		Depth	
	Frame Only	W/ Leveling Feet	W/ Casters	W/O Sides	W/ Sides	W/O Doors	W/ Doors
24U	46.0 (1168)	46.6 (1186)	47.1 (1199)	23.3 (591)	23.6 (600)	38.8 (986)	39.4 (1000)
42U	77.5 (1968)	78.1 (1986)	78.6 (1999)	27.2 (691)	27.6 (700)	42.8 (1086)	43.3 (1100)
45U	82.8 (2103)	83.4 (2121)	83.9 (2134)	31.1 (791)	31.5 (800)	46.7 (1186)	47.2 (1200)

Height, width, and depth dimensions are independent

Assembly instructions in this manual cover the various configurations of the Knurr DCM, either a single rack for simple equipment organization or a suite of Knurr DCM racks.

1.1 Feedback on Equipment, Instructions

Emerson Network Power is highly interested in providing high quality equipment and clear, concise instructions on installing and using the Knurr DCM and its optional equipment. If you have any comments about the rack, its options or instructions, visit

www.emersonnetworkpower/DCMfeedback

2.0 MAJOR COMPONENTS

A Knurr DCM may have any or all of the components addressed in this section, depending on its configuration.

2.1 Frame

The base of all Knurr DCM products is the frame. The Knurr DCM features a fully assembled, extruded aluminum frame with a patented T-slot that permits many of the cabinet's tool-less mounting features.

The racks can accommodate shelf- or rack-mounted equipment on 19-inch (483mm) adjustable rails. See **Knurr DCM model numbers on page 28** and illustrations for measurements of different models.

Cutouts in the top covers permit customer cable entry. The top of the Knurr DCM also is drilled for mounting a Liebert XDV top-mount cooling unit.

2.2 Enclosure

Exterior components of the Knurr DCM are painted black (RAL 7021)

2.2.1 Doors

All doors are framed from sheet metal and have hexagonal perforations leaving 83 percent of the door open to airflow for efficient cooling. A two-point latch and push button lock come standard.

Doors are available in single- or dual-door designs for easier access. All doors are removable and single doors are designed for reversible (left/right) hinging (see **3.7.1 - Remove the Door** and **3.7.2 - Reverse the Door**). Each type of door swings 135 degrees. Each door is perforated; each is available in RAL 7021, matching the rack

Doors are available in these styles and sizes:

- 1200mm x 600mm, single, **Part # 538444G1L**
- 1200mm x 600mm, split, **Part # 539273G1L**
- 1200mm x 700mm, single, **Part # 538444G2L**
- 1200mm x 700mm, split, **Part # 539273G2L**
- 1200mm x 800mm, single, **Part # 538444G3L**
- 1200mm x 800mm, split, **Part # 539273G3L**
- 2000mm x 600mm, single, **Part # 538444G4L**
- 2000mm x 600mm, split, **Part # 539273G4L**
- 2000mm x 700mm, single, **Part # 538444G5L**
- 2000mm x 700mm, split, **Part # 539273G5L**
- 2000mm x 800mm, single, **Part # 538444G6L**
- 2000mm x 800mm, split, **Part # 539273G6L**
- 2100mm x 600mm, single, **Part # 538444G7L**
- 2100mm x 600mm, split, **Part # 539273G7L**
- 2100mm x 700mm, single, **Part # 538444G8L**
- 2100mm x 700mm, split, **Part # 539273G8L**
- 2100mm x 800mm, single, **Part # 538444G9L**
- 2100mm x 800mm, split, **Part # 539273G9L**

2.2.2 Side Panels

Side panels for each size cabinet are fashioned from sheet metal. Quarter-turn fasteners outside the unit permit removal of all panels for maintenance while preserving internal security during normal operation.

An optional side panel lock with keys (**Part # 011399067L**) is available to secure the side panel. The lock insert is installed near the bottom center of the side panel.

To install the Side Panel Lock:

1. Insert a key into the lock to use as a handle.
2. Remove the locking nut from the cylinder.
3. Insert the lock, cam first, into the panel. The cam should be pointed to the right.
4. Slip the nut over the cam and tighten it onto the plastic lock cylinder.
5. Test the lock to ensure that it operates properly.

Figure 1 Side panel lock components



2.3 Mounting Hardware

Hardware to install all options is shipped with the Knurr DCM. Bags of nuts, screws, washers and other mounting hardware are attached to the frame. Some mounting hardware ships inside the box containing the optional equipment.

- 50 each: 10-32 cagenuts, screws and rosette washers
- 20 M5 spring nuts
- 20 M5 screws
- 4mm hex Allen wrench

3.0 INSTALLATION

3.1 Inspection

Upon receiving a Knurr DCM, examine the packaging for any signs of mishandling or damage. If any damage is noted, notify your local Liebert representative and your carrier immediately.

Figure 2 Knurr DCM as shipped



3.2 Required Setup Equipment

Each Knurr DCM ships with all the tools necessary to remove the unit from the pallet. The tool kit, (**Part # 542665G1**) contains the following tools:

- 1 M5 Allen Wrench
- 1 M6 Allen Wrench
- 1 Torx L Key ,T30

The following tools are required to set up a Knurr DCM:

- pallet jack or forklift
- utility knife or scissors
- 9/16" ratchet or wrench
- 6mm hex wrench

3.3 Unloading the Knurr DCM

Before unloading a Knurr DCM, note the weight of the model (see **6.0 - Specifications**). Use at least two people when moving the unit.

1. Using a pallet jack or forklift, move the Knurr DCM on its pallet to the installation location.
2. Cut the shrink wrap and remove all packaging.
3. Remove the lag bolts securing each shipping bracket to the shipping pallet; there is one bracket at each corner of the Knurr DCM; each bracket has two lag bolts (see **Figure 3**).
4. Raise the leveling feet so that the rack will rest on the feet:
 - a. Use the supplied hex wrench to lower each caster until the Knurr DCM is not resting on the shipping brackets.
 - b. Remove the hex bolts securing the shipping brackets to the Knurr DCM.

Leave the shipping brackets attached if they will be used to secure the cabinet to the floor.

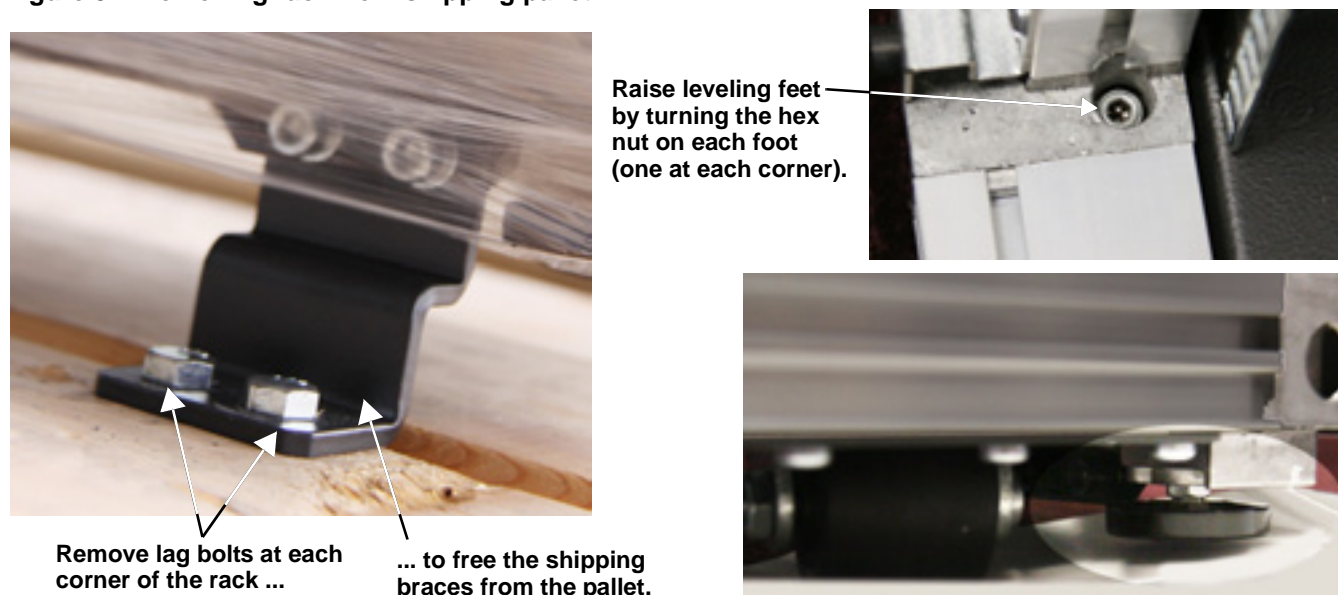
5. Use a pallet jack or forklift to raise the Knurr DCM off the shipping pallet.

6. Slide the shipping pallet out from under the rack.

The Knurr DCM may be positioned for installation either with the forklift, by two or more people carrying it or by rolling the cabinet on its casters.

If the casters are to be used to move the cabinet, the leveling feet must be raised by reversing **Step 4** above. Position the cabinet and either lower the leveling feet or bolt the cabinet to the floor with the shipping brackets.

Figure 3 Removing rack from shipping pallet



3.4 Equipment Layout

To keep the unit's center of gravity as low as possible, install equipment from the bottom up, starting with the heavier units. Leave any unused space at the top of the enclosure.



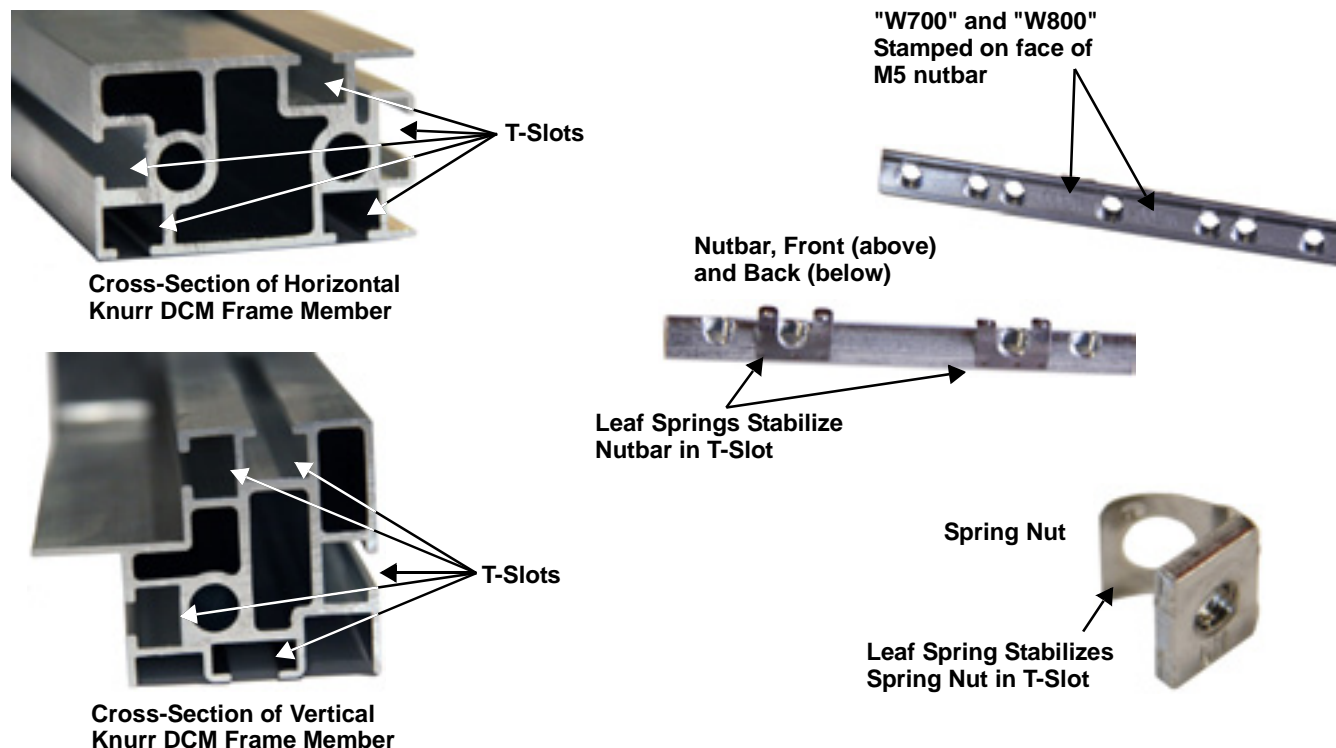
CAUTION

After equipment is installed, the Knurr DCM may have a high center of gravity. Avoid tipping the unit when it is being moved.

3.5 Basic Hardware Installation—Nutbars and Spring Nuts

The Knurr DCM is designed with T-slots on exposed faces of the aluminum frame members. These T-slots permit placing nutbars and spring nuts anywhere along a frame member to mount equipment at any distance desired (see **Figure 4**). Nutbars and spring nuts accept M5 and M6 screws used to attach most equipment and options to the rack's aluminum frame members.

Figure 4 T-slot configuration and nutbar

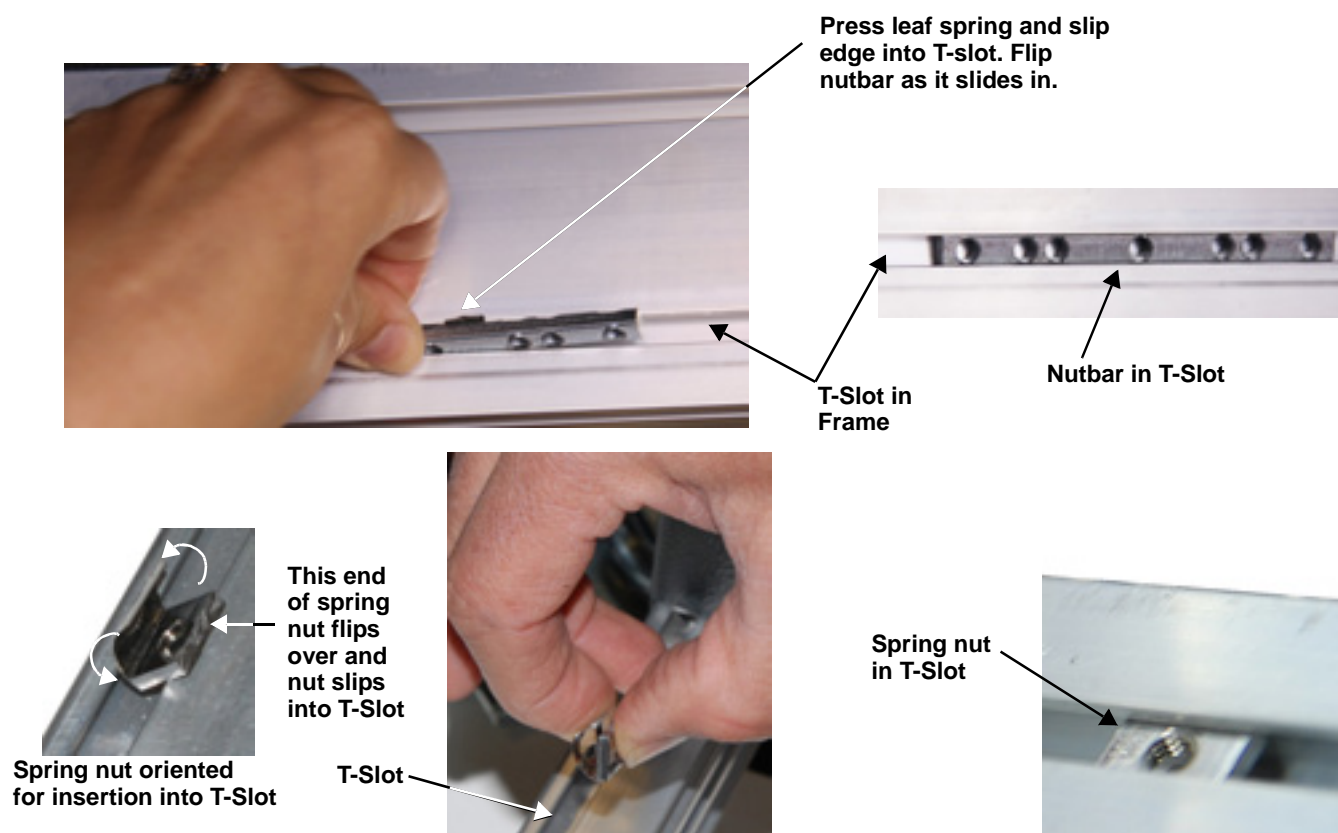


3.5.1 Inserting a Nutbar or Spring Nut

To insert a nutbar or spring nut into a T-slot on the Knurr DCM frame, compress the spring on the back of the nutbar and slip it into the T-slot (see **Figure 5**). If the nutbar or spring nut does not flatten out into the slot, press down on the edge of the block that is too high.

Properly installed nutbars and spring nuts have the thread hole section on the outer side of the T-slot (see **Figure 5**). The leaf spring holds the nutbar or spring nut in place while a screw is threaded and tightened. Nutbars and spring nuts can be pressed down with a small tool and moved for better alignment.

Figure 5 Insert nutbar or spring nut



3.6 Frame and Enclosure Configurations

3.6.1 Internal Mounting Rails

The Knurr DCM can accommodate rack-mounted or free-standing computer and network equipment. The unit features 19-inch (483mm) rack rails. These internal front- and rear-mount rails are designed in accordance with the EIA 310D rack standard. The rails are adjustable for installing equipment of different sizes.

Accessories compatible with the 19" rails includes a tool-less fixed shelf (**Part # 002185000**, L-shaped depth-adjustable support rail (**Part # 542777G1**), a tool-less telescopic shelf (**Part # 535809G1**) and a lockable, fully enclosed 2U drawer (**Part # 011139278**). Each is supplied with installation hardware.

3.6.2 Front- and Rear-Mount Rails—Position and Attach

Front- and rear-mount vertical rails are installed in the Knurr DCM at the factory at 29.13 inches (740mm). They are secured to the 600mm Knurr DCM's aluminum frame using threaded block nutbars in the T-slot at top and bottom of the EIA rail and M6 x 12 screws. Mechanical fasteners in are used in center of the EIA rail to tie into the center depth support member. Vertical rails are installed in the 700 and 800mm Knurr DCM using a cross-brace at the top; node brackets are used at the bottom and on the center horizontal rails. The cross-brace and node brackets attach to the cabinet frame with Torx head screws and nutbar. The rails can be moved to change the front-to-rear distance between the rails.



NOTE

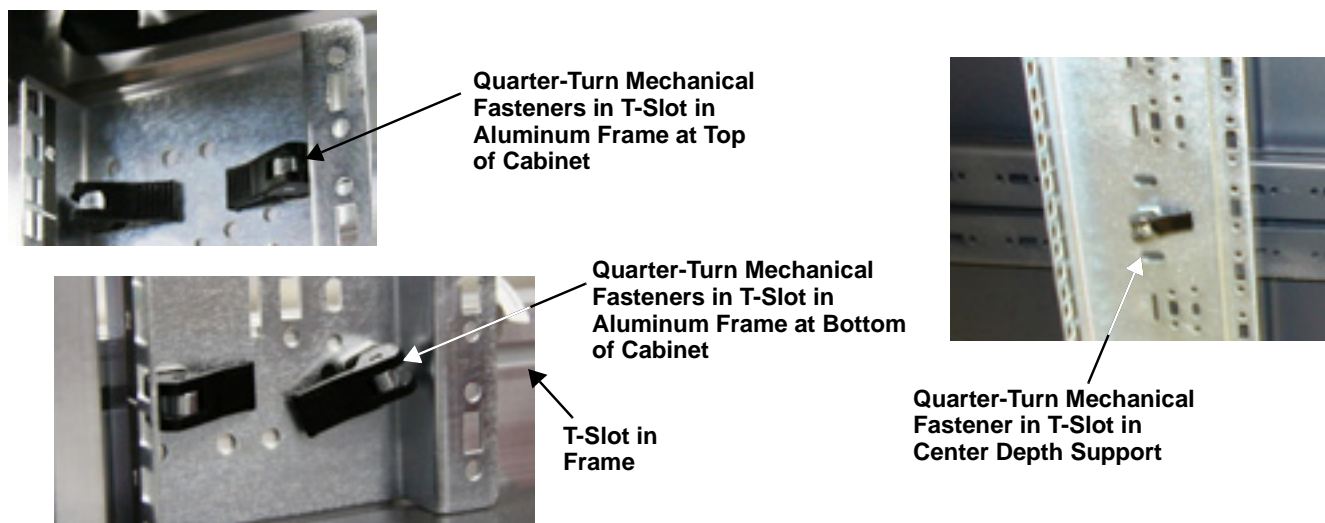
The front and rear vertical rails must be kept at a 90-degree angle to the upper and lower aluminum frame members. The left and right front vertical rails must be the same distance from the front of the rack; the left and right rear vertical rails must be the same distance from the rear of the rack.

If those conditions are not met, equipment and optional features will be difficult to install.

Position Vertical Rails in 600mm Cabinet

1. Determine the proper location of the rails.
2. Remove the quarter-turn fasteners in the middle of one of the rear vertical rails (see **Figure 6**).
3. Loosen the M6 screws from the nutbar that hold the 19" rail in place at the bottom.
4. Hold the 19" rail to keep it from falling and loosen the M6 screws holding the nutbar at the top of the 19" rail.
5. Slide the rail as unit to the desired position, making sure it is properly oriented as described in the **Note** above.
6. Hold the rail in place, then insert and tighten the quarter-turn fastener in the middle of the vertical rail.
7. Tighten the M6 screws into the nutbar to reattach the 19" rail.
8. Repeat **Steps 2** through **7** for the corresponding vertical rail.

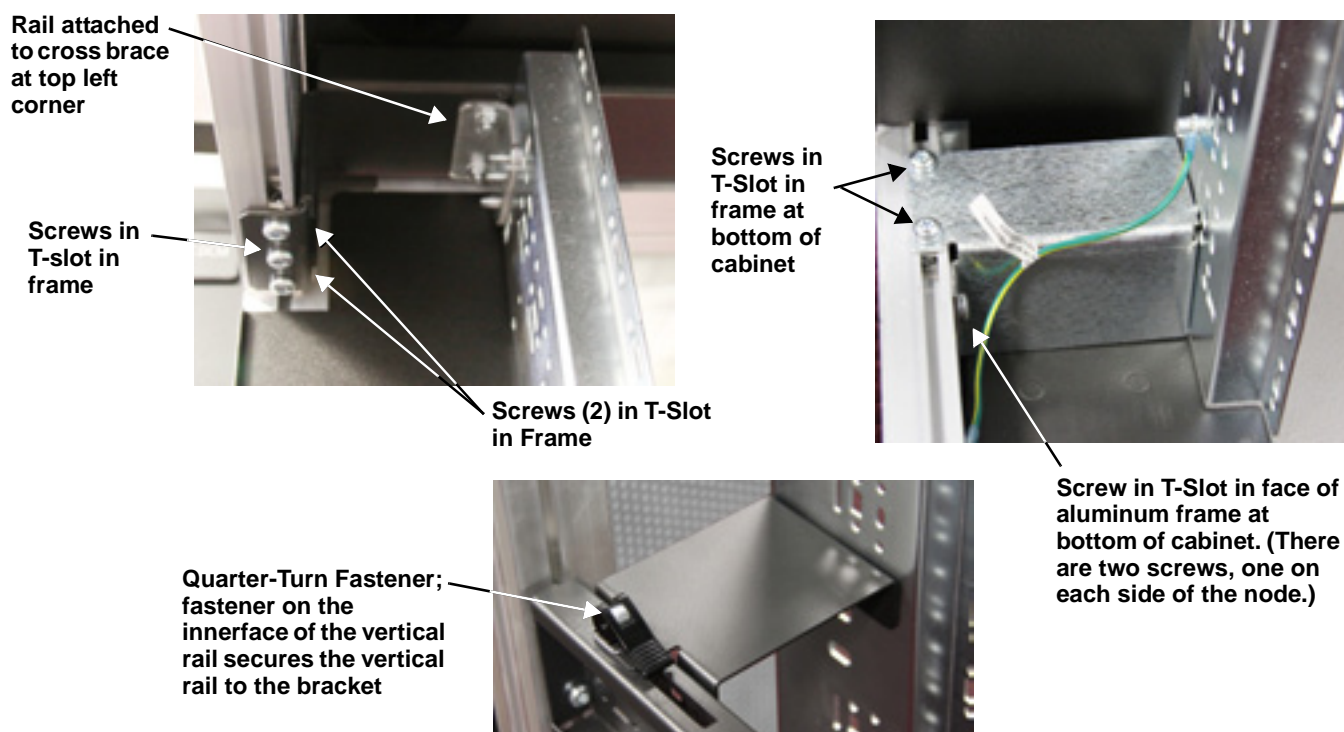
Figure 6 Vertical rail repositioning—600mm cabinet



Position Rails on 700mm and 800mm Cabinets

1. Determine the proper location of the rails.
2. Remove center support by loosening the two quick-release mechanical fasteners.
Repeat for other side of the EIA rail frame (see **Figure 7**).
3. Loosen the four screws that secure the node brackets to the bottom frame member.
Repeat on the other side of EIA rail frame.
4. Loosen the three screws that secure the top EIA rails support bracket to the top frame member.
Repeat on the other side of the EIA rail frame.
5. Slide the rails to their new location. The rails will bind if they are not kept at a right angle to the frame.
6. Tighten all hardware and reinstall the quick-release mechanical fasteners.

Figure 7 Vertical rail repositioning—700 and 800mm cabinets



3.7 Door—Remove and Reverse

Knurr DCM doors are removable for convenience when installing or maintaining equipment. They also are reversible, so the single-door may be opened in a more convenient direction if the rack is near a wall or other equipment.

Doors are supported by two hinges and held in place by gravity. They can be lifted off and reinstalled without tools.

Doors are available in these styles and sizes:

Table 2 Door dimensions, single door

Frame Size		Door Dimensions, in (mm)		Part Number
		Height	Width	
24U	46.6 x 23.6 (1200 x 600)	46 (1168)	23.2 (589)	Part # 538444G1L
	46.6 x 27.6 (1200 x 700)		27.1 (689)	Part # 538444G2L
	46.6 x 31.5 (1200 x 800)		31.1 (789)	Part # 538444G3L
42U	78.1 x 23.6 (2000 x 600)	78 (1968)	23.2 (589)	Part # 538444G4L
	78.1 x 27.6 (2000 x 700)		27.1 (689)	Part # 538444G5L
	78.1 x 31.5 (2000 x 800)		31.1 (789)	Part # 538444G6L
45U	83.4 x 23.6 (2100 x 600)	83 (2103)	23.2 (589)	Part # 538444G7L
	83.4 x 27.6 (2100 x 700)		27.1 (689)	Part # 538444G8L
	83.4 x 31.5 (2100 x 800)		31.1 (789)	Part # 538444G9L

Table 3 Door dimensions, split door

Frame Size		Door Dimensions, in (mm)		Part Number
		Height	Width	
24U	46.6 x 23.6 (1200 x 600)	46 (1168)	11.5 (293)	Part # 539273G1L
	46.6 x 27.6 (1200 x 700)		13.5 (343)	Part # 539273G2L
	46.6 x 31.5 (1200 x 800)		15.4 (393)	Part # 539273G3L
42U	78.1 x 23.6 (2000 x 600)	78 (1968)	11.5 (292)	Part # 539273G4L
	78.1 x 27.6 (2000 x 700)		13.5 (342)	Part # 539273G5L
	78.1 x 31.5 (2000 x 800)		15.4 (392)	Part # 539273G6L
45U	83.4 x 23.6 (2100 x 600)	83 (2103)	11.5 (292)	Part # 539273G7L
	83.4 x 27.6 (2100 x 700)		13.5 (342)	Part # 539273G8L
	83.4 x 31.5 (2100 x 800)		15.4 (392)	Part # 539273G9L

3.7.1 Remove the Door

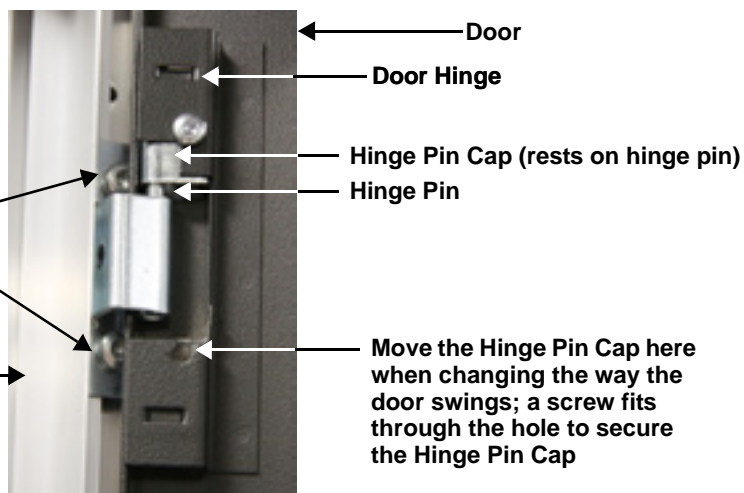
1. Open the door and swing it open about 90 degrees.
2. Lift the door slightly until the hinge pins clear the hinge pin caps and slide the door free (see **Figure 8**).

Figure 8 Door hinge removal

Hinge is on the Knurr DCM door. Lift the door until the hinge pins at the top and bottom clear and slide the door free. The door is held in place by gravity.

Torx head screws hold the hinge pin assembly to the Knurr DCM frame

Knurr DCM frame



3.7.2 Reverse the Door

1. Determine the correct location for the hinge pin assemblies, both top and bottom.
2. Mark the corresponding new position on the opposite side of the Knurr DCM. The frame is tapped for proper hinge placement.
3. Lift the door off the Knurr DCM.
4. Take out the screws to remove the hinge pin assemblies; each assembly is attached with two screws.
5. Attach the hinge pin assemblies in the new locations on the opposite side.
6. Remove the pin and reinstall it on the opposite hole. (When the door is reversed, the pin will be pointing down.)
7. Extract the screw holding the hinge pin cap in place.
8. Flip the Hinge Pin Cap and insert it in the other end of the hinge on the door (see **Figure 8**).
9. Insert and tighten the screw holding the Hinge Pin Cap in the hinge.
10. Repeat **Steps 7 through 9** for the other hinge.
11. Flip the door, and slide it into place.
12. Remove the unit badges from the front of the door and reattach them near what is now the top of the door.

3.7.3 Reverse the Door Handle

After the door has been reversed, the door handle of the Knurr DCM will operate without adjustment, but it will be upside down. To reverse the handle, follow these steps:

1. Open the door and remove all the bolts holding the door handle and lock assembly, including the four brackets. Studs and nuts secure the brackets to the door frame.
2. Flip the door handle and lock assembly 180 degrees and reattach it with the bolts and nuts.
3. Check the handle and lock to ensure they operate properly.

3.8 Side Panels—Remove and Replace

Knurr DCM side panels are simple to remove and replace, making it easier to install equipment. Panel removal also eases maintenance and replacing equipment.

Table 4 Optional side/partition panel sizes and part numbers

Height, mm	Depth, mm	Part Numbers	
		Side Panels	Partition Panels
1200	1000	538521G1L	538521G1L
	1100	538521G2L	538521G2L
	1200	538521G3L	538521G3L
2000	1000	538521G4L	538521G4L
	1100	538521G5L	538521G5L
	1200	538521G6L	538521G6L
2100	1000	538521G7L	538521G7L
	1100	538521G8L	538521G8L
	1200	538521G9L	538521G9L

3.8.1 Remove a Panel

Side panels are attached to the Knurr DCM with 10 quarter-turn plastic retainers. The top of the side panel has a lip that hangs on the top of the cabinet.

To remove a panel, use a large, flat-blade screwdriver to turn each plastic retainers one-fourth of a turn or 90 degrees counterclockwise. Lift the panel up and away from the rack. Set it aside.



NOTE

Spinning the plastic quarter-turn retainers more than 90 degrees could damage the retainers.

3.8.2 Replace a Side Panel

1. Hang the side panel on the lip at the top of the Knurr DCM frame.
2. Use a large, flat-blade screwdriver to turn each of the 10 panel retainers clockwise one-fourth of a turn or 90 degrees.

4.0 OPTIONS—INSTALLATION

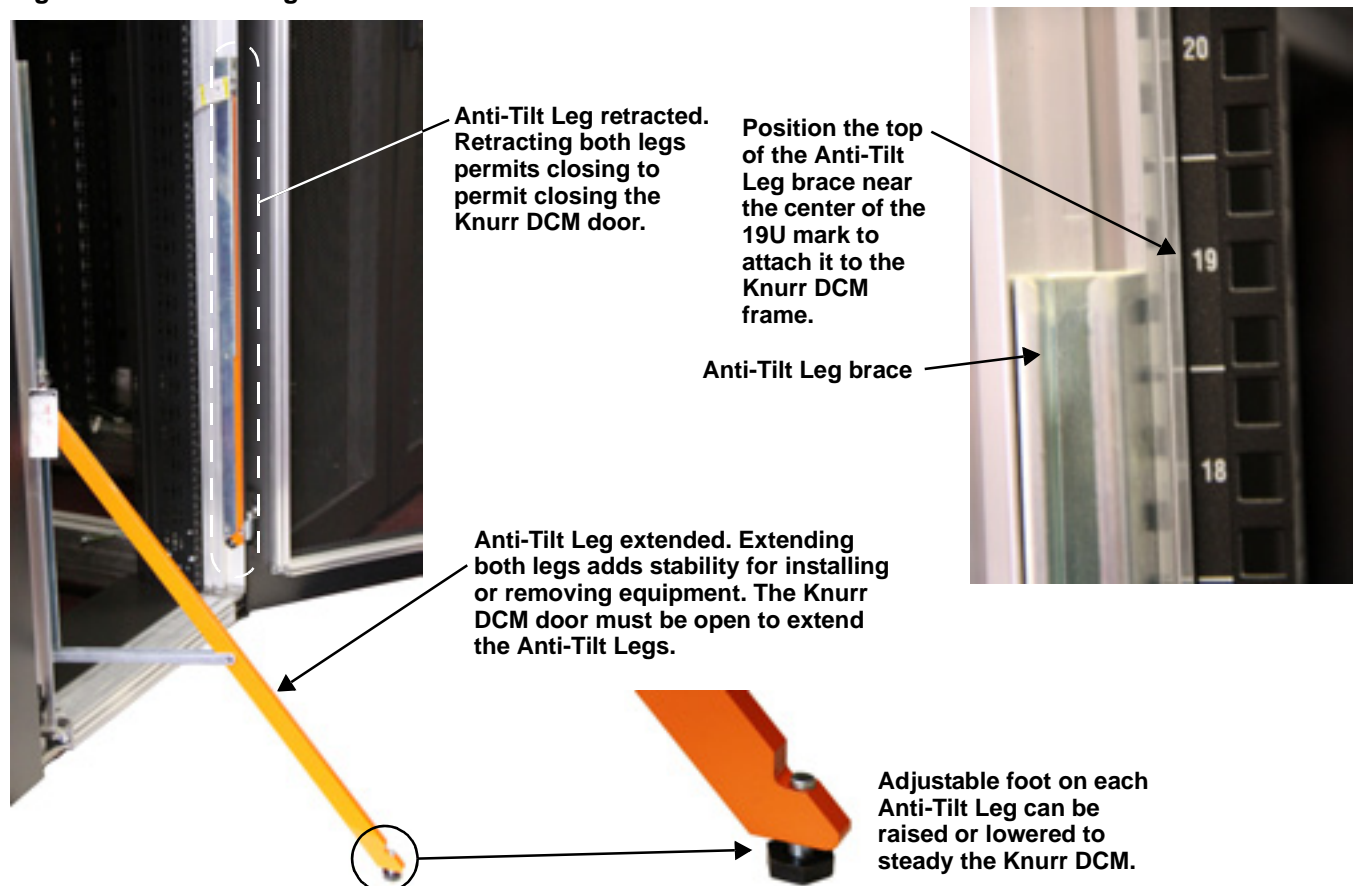
4.1 Anti-Tilt Kit (Part # 540254G1L)

An anti-tilt kit can be installed to stabilize the Knurr DCM when installing or removing equipment from the rack. The kit includes the adjustable legs and mounting hardware.

The stabilizer legs attach to the front of the Knurr DCM frame. After attaching the stabilizers, pull out the metal pin at the top of a leg and extend that leg to the needed distance. Lock it into place by releasing the spring-loaded pin and letting it lock into the brace that is attached to the rack. To install the anti-tilt kit:

1. Insert four spring nuts into each T-slot on the front of the rack's vertical frame member.
2. Align the spring nuts with the holes on the Anti-Tilt Leg.
To move a spring nut, press down on it with a small screwdriver or similar tool and slide it into position.
3. The top of the Anti-Tilt Leg should be positioned at the 19U mark as shown in **Figure 9**.
4. Install one Torx head screw in the top hole.
5. Install the two flathead Phillips screws in the two center holes.
6. Install the remaining Torx head screw in the bottom hole.

Figure 9 Anti-Tilt Legs installed



4.2 1U Tool-Less Fixed Shelf Installation

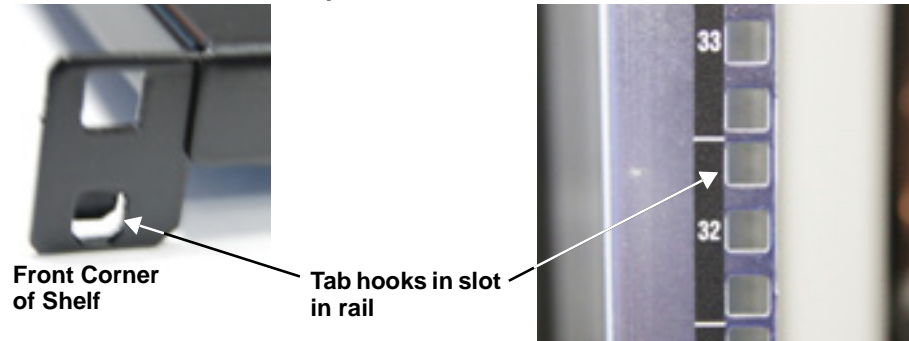
The 1U tool-less fixed shelf (**Part # 002185000**) has tabs on the front and rear that slip into square holes in the 19" rails. The shelf has a maximum load rating of 150 lb. (68kg).



NOTE

Do not tilt the back of the 1U tool-less fixed shelf down without securing the extensions. The extensions do not have a positive stop fixture to keep the extensions from falling out.

Figure 10 1U tool-less fixed shelf installation point



4.3 1U Tool-Less Telescopic Shelf

The 1U telescopic shelf (**Part # 535809G1**) has tabs on the upper half of the front and rear to hold it in place. The telescopic slide is assembled and attached to the shelf for shipping. The shelf has a maximum load rating of 110 lb. (50kg).

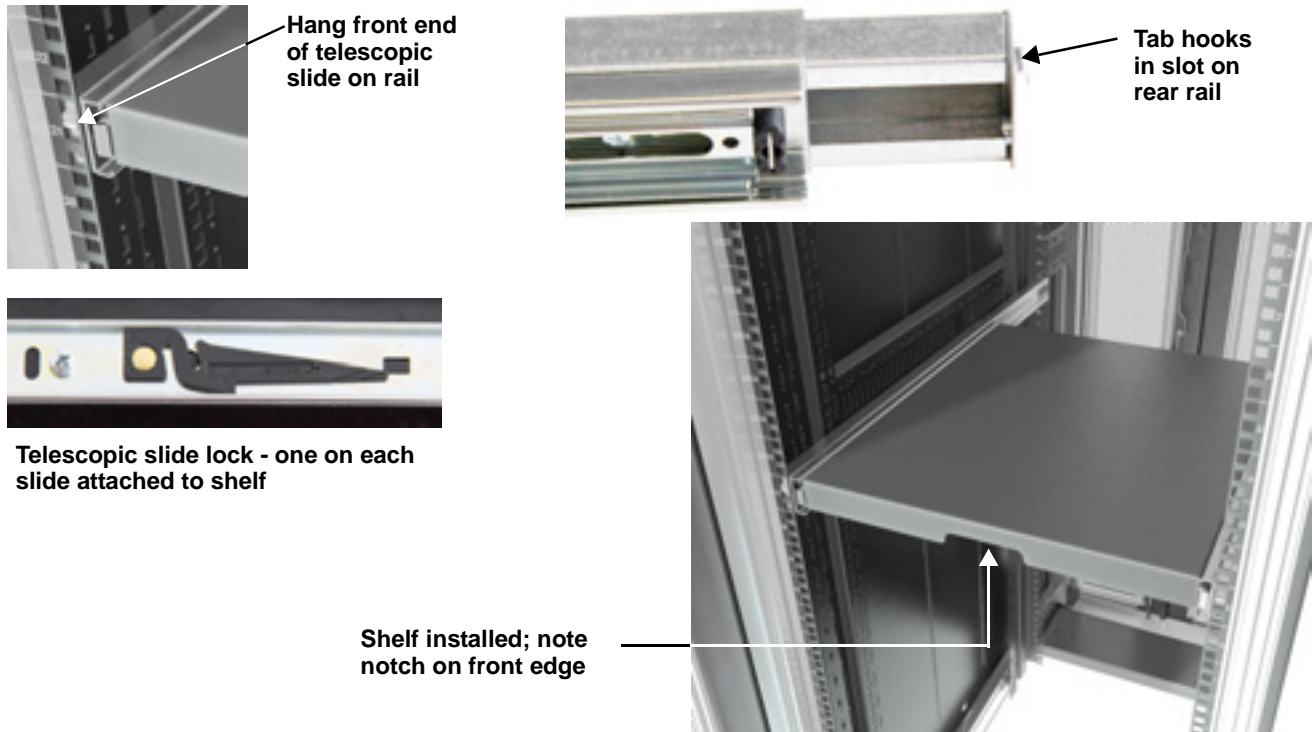
To install the shelf:

1. Pull the telescopic slide toward the back of the shelf.
2. Press the lock on the telescopic slide and pull the slide off the shelf. The locks work in opposite directions: press down on the lock on one side to release it; press up on the other lock to release it.
3. Repeat **Steps 1** and **2** for the telescopic slide on the other side of the shelf.
4. Hang the telescopic slide on the rack's rails with the tabs on the upper half of the telescopic slide (see **Figure 11**).

Make sure that the front and rear tabs are level; the tabs should be slots with the same number.

5. Repeat **Step 4** for the second telescopic slide. Make sure the telescopic slides are level.
6. Slide the shelf into the slide until it reaches the back, securing the components. The shelf will enter more easily if it is kept square with the telescopic slides. The front of the shelf has a notch to grasp it when pulling the shelf out (see bottom portion of **Figure 11**).

Figure 11 1U tool-less telescopic shelf installation



4.4 2U Locking Drawer Installation

An optional 2U drawer (**Part # 011139278**) with a keyed lock is available (see **Figure 12**). The drawer has a static load rating of 30 lb. (13.6kg). The drawer mounts with four bolts on the rack's front rails.



NOTE

This operation may require two people.

To attach the locking drawer:

1. Determine the mounting position for the drawer.
2. Insert two cagenuts at the appropriate height in each of the front vertical rails.
The nuts must be at the same height as determined by the numbered mounting holes on the vertical rails.
3. Support the drawer so that the metal flanges on either side of the drawer are in front of the rail.
4. Insert a thumb screw with a lock washer through a slot in a flange on the drawer.
5. Thread it into the cagenut and tighten firmly, using a hex wrench, if necessary.
6. Repeat **Steps 4** and **5** to secure the drawer at all four mounting holes in the flanges.

Figure 12 Locking drawer



4.5 Power Distribution Unit Mounting

Power distribution units may be mounted multiple ways in the Knurr DCM rack. They may be mounted on the rails or attached to mounting brackets:

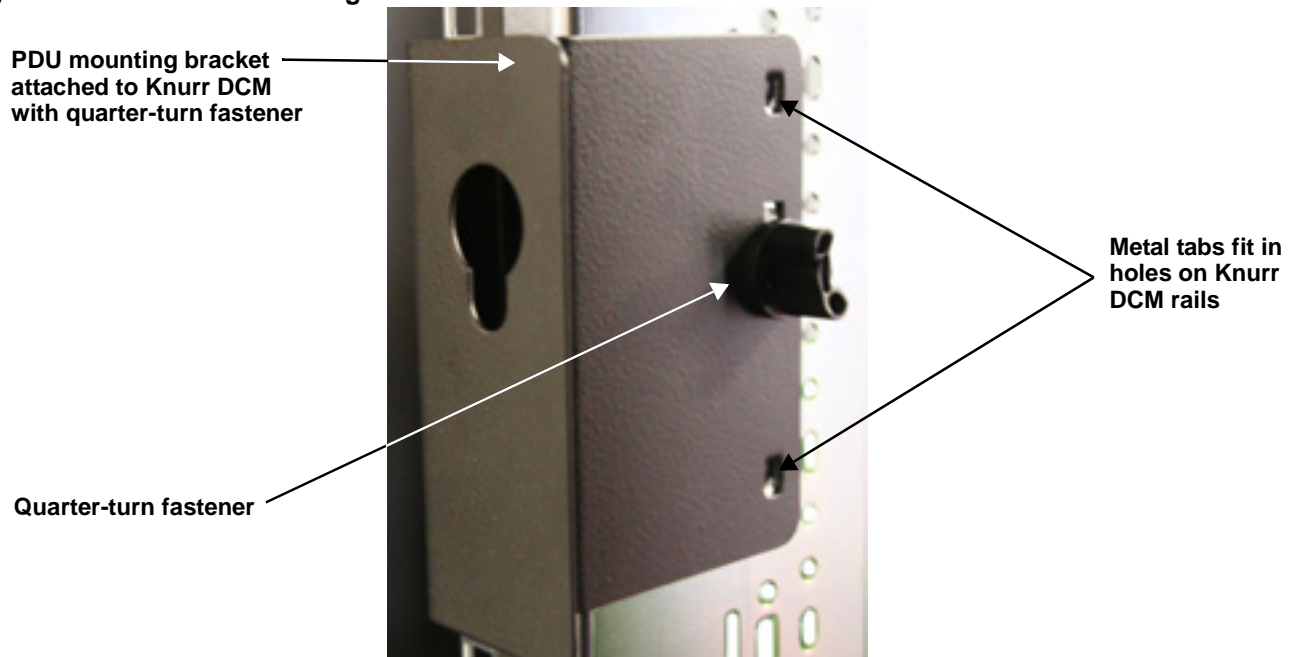
- 42U full height PDU mounting brackets (4"W) **Part # 539486G1L**
- 42U full height PDU mounting brackets (8"W) (**Part # 540084G1L**)
- 45U full height PDU mounting brackets (4" W) (**Part # 539487G1L**)
- 45U full height PDU mounting brackets (8"W) (**Part # 540085G1L**)
- 42U adjustable full height PDU mounting bracket (4"W) (**Part # 542868G1L**)
- 45U adjustable full height PDU mounting bracket (4" W) (**Part # 542906G1L**)
- *42U inset full height PDU mounting bracket (4"W) (**Part # 542919G1L**)
- *45U inset full height PDU mounting bracket (4"W) (**Part # 543002G1L**)

* Use this full height PDU bracket only when the center depth support has been removed.

4.5.1 Install Tool-Less PDU Mounting Brackets—700 and 800mm Cabinets Only

1. Choose a position near the top of 19" rail where the first tool-less PDU mounting bracket will be installed.
2. Hang the tool-less PDU mounting bracket on a 19" rail by slipping the bracket's metal tabs into the rectangular shaped cutout on the 19" rail.
3. Insert a high-profile fastener into the tool-less PDU mounting bracket and turn the fastener to the right to tighten it (see **Figure 13**).
4. Insert the other tool-less PDU mounting bracket near the bottom of the 19" rail.
Be sure it is positioned to align with the mounting holes on the PDU.
5. Insert a high-profile quarter-turn fastener into the tool-less PDU mounting bracket; turn it clockwise to tighten it.
6. Attach the rack PDU to the upper and lower PDU brackets.
 - The left hand tool-less rack PDU mounting bracket part number is **Part # 539918G1L**
 - The right hand tool-less rack PDU mounting bracket part number is **Part # 539917G1L**

Figure 13 Small PDU mounting bracket on rack frame



4.5.2 Full-Height PDU Mounting Brackets

Three models of full-height PDU mounting brackets may be installed for a greater range of mounting options. For standard positioning of a PDU, the fixed type can be used to place a PDU in either rear corner of the rack. The inset PDU mounting bracket permits mounting a PDU nearer the side of the cabinet, essentially recovering unused space. The adjustable PDU mounting bracket can be used to mount a PDU at varying distances from the front or rear of the rack.

Available full-height PDU mounting brackets are:

- 42U, 4" wide: fixed PDU, **Part # 539486G1L**; inset PDU, **Part # 542919G1L**; adjustable PDU, **Part # 542868G1L**
- 42U, 8" wide: fixed PDU, **Part # 540084G1L**
- 45U, 4" wide: fixed PDU, **Part # 539487G1L**; inset PDU, **Part # 543002G1L**; adjustable PDU, **Part # 542906G1L**
- 45U, 8" wide: fixed PDU, **Part # 540085G1L**

To install a full-height PDU bracket:

1. Position the full-height PDU mounting bracket for installation; refer to **Figure 14** for placement.
2. Hold the PDU bracket in place and insert and tighten the fasteners. The fastener used varies depending on the PDU bracket and PDU:
 - **Fixed, full-height PDU mounting bracket:** use mechanical, quarter-turn fasteners.
 - **Inset, full-height PDU mounting bracket:** with Liebert MPX™ PDU, use M5 hardware and spring nuts; with Liebert MPH™ PDU use M5 hardware and spring nuts; with Knurr DI-STRIP® PDU, use mechanical, quarter-turn fasteners; the center depth support must be removed from the cabinet before installing this type of bracket, regardless of the type of PDU to be mounted.
 - **Adjustable, full-height PDU mounting bracket:** with Liebert MPX PDU, use M5 hardware and spring nuts; with Liebert MPH PDU or Knurr DI-STRIP PDU, use mechanical, quarter-turn fasteners.

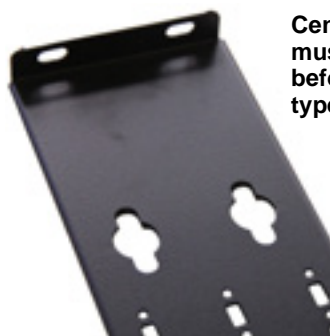
Figure 14 Full-height PDU mounting brackets

Top or bottom of fixed, full-height PDU bracket. Ends are identical, permitting use on either side of the cabinet. 4" wide and 8-inch wide brackets available)



The ends attach to the aluminum frame members as shown above.

Top of inset, full-height PDU bracket, 4" wide
Attaches to inner face of horizontal aluminum frame member at top of rack.



Bottom of inset, full-height PDU bracket, 4" wide
Attaches to upper face of horizontal aluminum frame member at bottom of rack.

Center depth support must be removed before installing this type of bracket

Top or bottom of adjustable, full-height PDU bracket, 4" wide.
Attaches to inner face of horizontal aluminum frame member at top or bottom of rack.

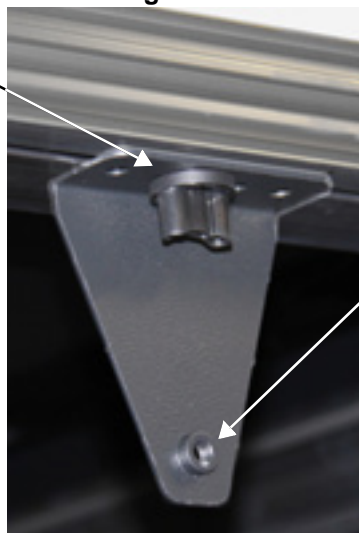


4.6 Install RPC™ BDM™ Mounting Brackets

The RPC BDM, used to monitor Liebert MPX and Liebert MPH PDUs, can be mounted on the Knurr DCM's aluminum frame or door. Mounting the RPC BDM on the frame requires a quarter-turn fastener; mounting it on the door is done with two Phillips head screws (see **Figure 15**).

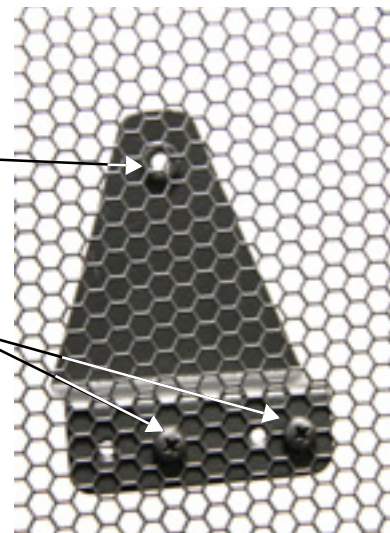
Figure 15 RPC BDM mounting brackets and fasteners

Quarter-turn fastener secures RPC BDM mounting bracket to Knurr DCM frame



RPC BDM attaches here

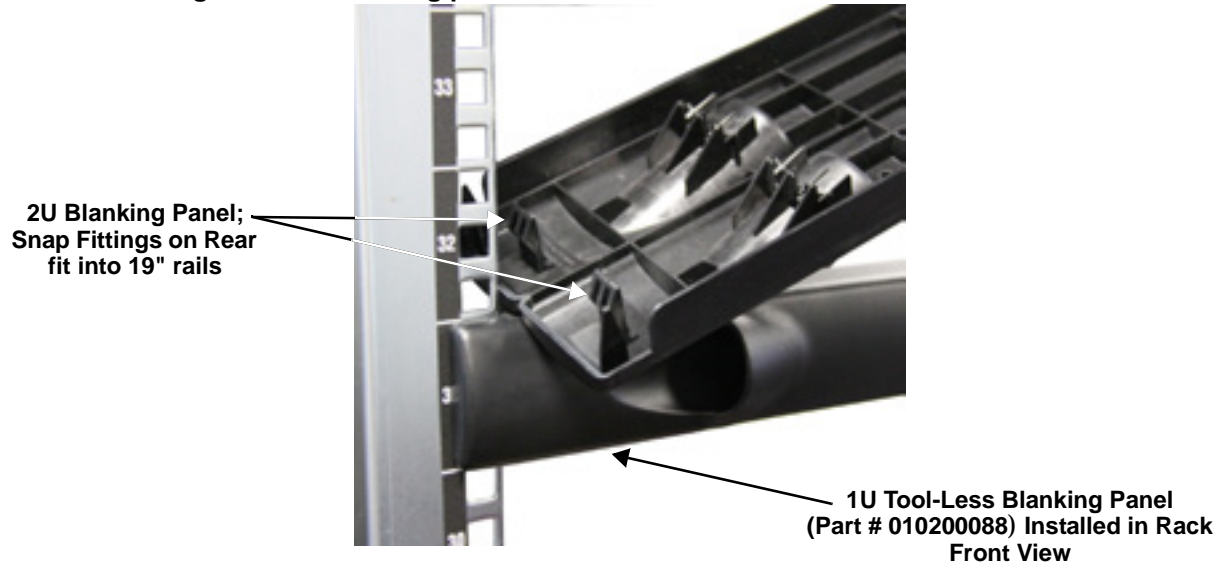
Phillips head screws secure RPC BDM mounting bracket to Knurr DCM door



4.7 Tool-Less Blanking Panels

Tool-less blanking panels can be snapped onto the Knurr DCM 19" rails to block unused portions of the rack. Blocking the open areas enhances airflow through the rack equipment. The blanking panels are available in 1U (**Part # 010200087**) and 2U (**Part # 010200088**). Attach the panels by snapping the tabs on the back into square holes in the 19" rails as shown in **Figure 16**.

Figure 16 Installing tool-less blanking panels



NOTE

Emerson recommends inserting blanking panels in any unused portion of the rack to promote proper airflow through the rack equipment.

4.8 Cluster Configuration

Two or more Knurr DCM cabinets of the same height can be connected in a cluster with the optional Cluster Kit of suite brackets and flexible dress strip (24U, **Part # 539608G1**; 42U, **Part # 539608G2**; 45U, **Part # 539608G3**) or with the standard, factory-installed cluster tab. The brackets put the cabinets on 24" (609.6mm) centers, which matches the size of U.S. floor tiles, enhancing integration with underfloor cooling systems. The bracket and plastic strip serve as finishing pieces and close the gap between the cabinets.

Connecting Knurr DCMs is easier if the units have been moved to their final installation position before beginning to attach them in a cluster.

4.8.1 Connect Two Racks Using the Tool-Less Cluster Kit

1. Remove the adjacent side panels from the cabinets that will be clustered together (see **3.8.1 - Remove a Panel**). The panels on the outside of the cluster can be left on the cabinets to help manage airflow.

2. Get the needed number of tool-less rack cluster kits.

One kit will cluster two racks together in front and rear. Two cluster kits will cluster three cabinets together, three cluster kits will cluster four cabinets together and etc. Each cluster kit contains four interchangeable metal cluster brackets and two plastic filler strips. Pressing the filler strips into the opening between the cabinets reduces the loss of cold air.

3. Level the cabinets and make sure both frames are the same height off the floor.
4. Remove the racks' doors (see **3.7.1 - Remove the Door** if necessary).
5. Install a cluster bracket as shown in **Figure 17** by pressing the integral pins into holes in the cabinet frame.

The brackets can be installed in any order, starting with either the top of the cabinet or the bottom of the cabinet.

6. Secure the cluster bracket in place with two quarter-turn fasteners as shown in **Figure 17**.
7. Repeat **Steps 5** and **6** for the remaining cluster bracket.
8. Snap the plastic strip in the gap between the cabinets.

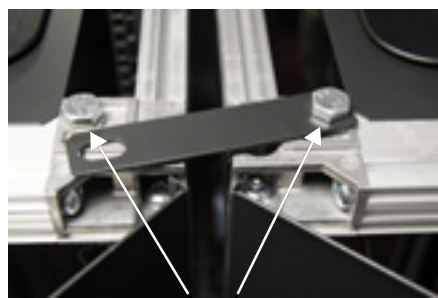
4.8.2 Connect Two Racks Using the Factory-Installed Cluster Tab

Cabinets being clustered using the cluster tab can be clustered with or without the side panels. To do so:

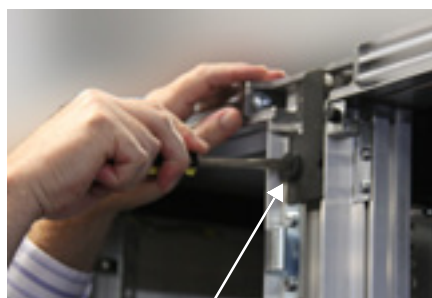
1. Make sure the cabinets are the same height off the floor.
2. Remove the bolt on the top of adjacent corners of the racks, front and rear, as shown in the top left illustration in **Figure 17**.

Swing cluster tab over to adjacent cabinet and reinsert and tighten the bolt.

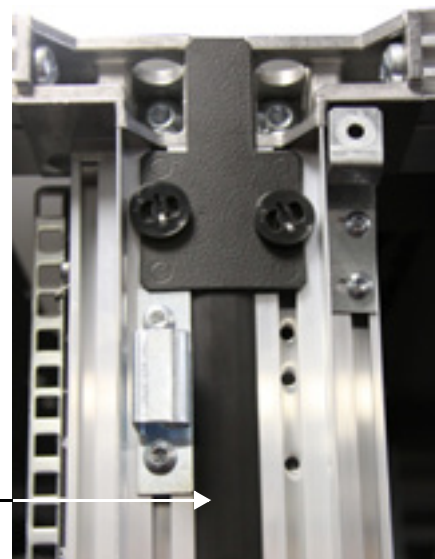
Figure 17 Cluster connections



Remove the bolt shown above on the left cabinet. Swing the cluster tab over to the cabinet on the left and reinsert and tighten the bolt. Repeat for rear of cabinet.



Position the cluster bracket against the front of the cabinets to be connected. Insert and tighten two low-profile quarter-turn fasteners.



Snap the dress strip into place to complete the cluster connections.

4.9 Cable Management

When designing the equipment layout in the Knurr DCM, consider how cables must be run for each configuration and how cable runs affect cooling, access and operational factors, such as separating power and communication cables to reduce electromagnetic interference.

Good cable management contributes to:

- Effective airflow for cooling
- Easier cable identification
- Improved access
- Reduced electromagnetic interference
- Proper bend radii, particularly for fiber optic cables
- Adequate support for large cables and heavy cable bundles



NOTE

When installing cables, leave enough slack for the unit to be rolled forward or sideways for access to components.

Do not defeat the ground/earth connections between the utility/mains outlet and the Knurr DCM.

Once equipment has been installed, cables for power and communication may be connected. Before making any connections, check the equipment to ensure that all power switches are in the Off position.

Numerous cable entrances and management provisions are built into the various Knurr DCM configurations to ease cable installation.

Additionally, these cable management options are available to assist with routing power and control cables to reduce electromagnetic interference and to improve airflow:

- Cable Fingers—**Part # 010200078**
- Lobster Claw
 - pack of 10, **Part # 002185050**
 - pack of 100, **Part # 002185070**
- Velcro Straps
 - pack of 10, **Part # 002185060**
 - pack of 100, **Part # 002185080**
- Cable Trough, (482.6mm), **Part # 050400558**
- 1U Cable Routing Panel—**Part # 011170208**
- 1U Cable Routing Panel with D Rings—**Part # 011171448**

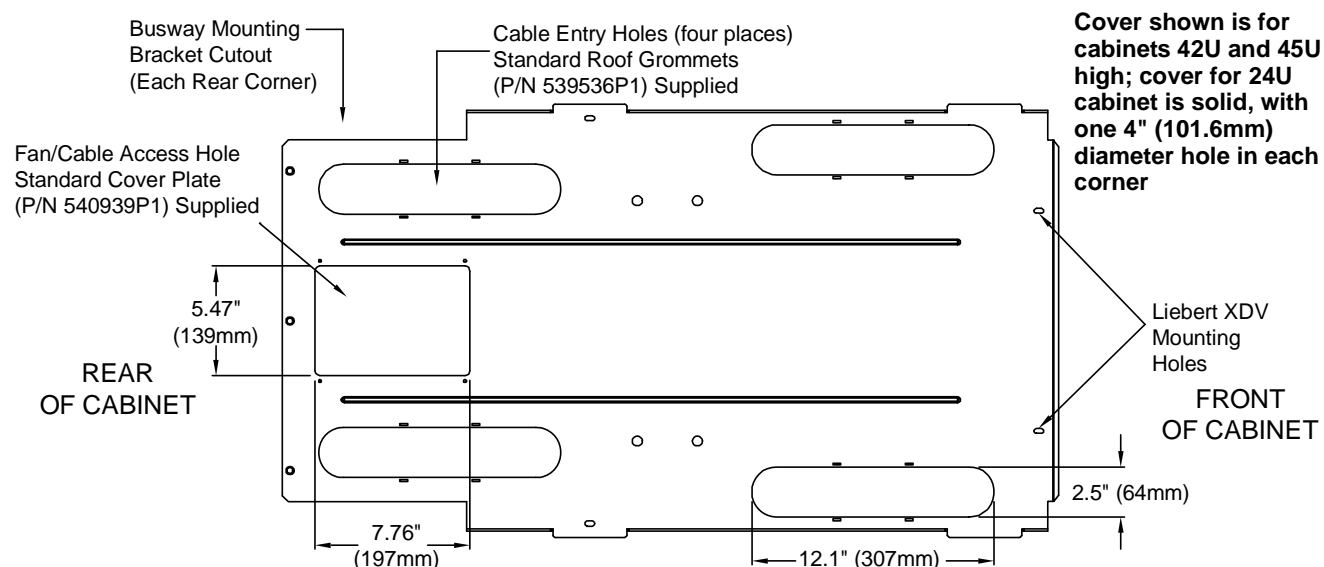
Velcro straps are field-attached in any number of ways. They can be wrapped through slots in the internal mounting rails and support vertical cable management, attached through small brackets or to other components.

4.10 Cable Access—Top Cover, Back and Base

A fully removable top cover is available on Knurr DCM enclosures. These features are available:

- **24U cabinets:** solid, with one 4" (101.6mm) diameter hole in each corner
- **42U and 45U cabinets:** rectangular hole in the rear for mounting a fan or for cabling. Four cable entry slots, supplied with grommets are also available for cabling. Slots at each side on the rear are fabricated for accepting tool-less modular busway brackets.

Figure 18 Top cover for Knurr DCM cabinets 42U and 45U high



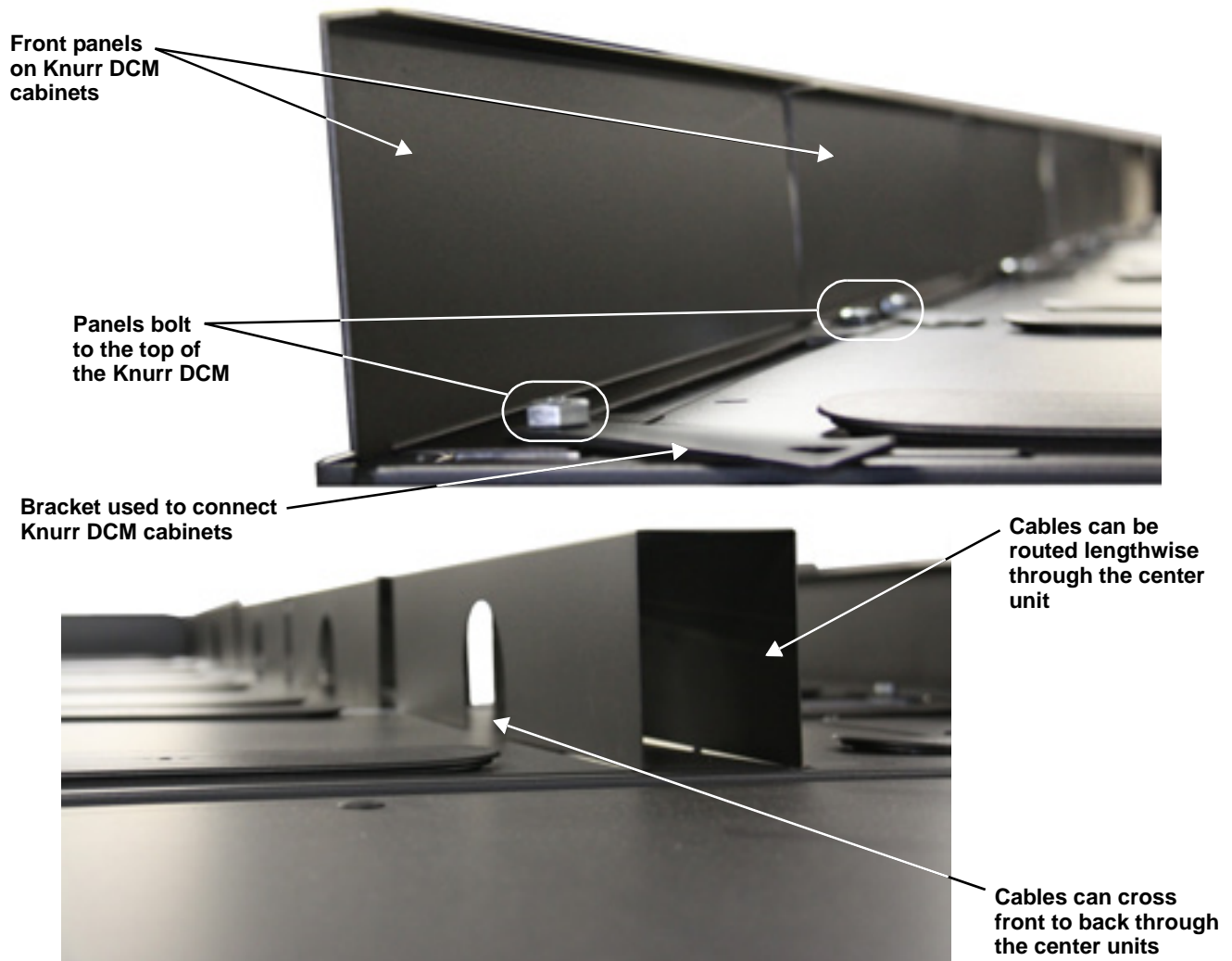
The bottom of the Knurr DCM is open for cable entry. The low-profile caster plinth has a rectangular slot for cable entry.

4.11 Top Cover Cable Management Kit

Top Cover Cable Management kits assist in organizing cables routed across the top of one or more Knurr DCM racks. Panels may be attached to the front, rear and sides of the Knurr DCM and a center management unit may be installed in the center of the racks.

The front, rear and side panels attach to the cabinet with the bolts at each corner (see **Figure 19**). Center cable management units attach to the Knurr DCM with tabs that fit into slots on the top cover. They are held in place by spring tension.

1. Install the center piece first by squeezing it and sliding the four tabs into the holes in the top of the rack.
2. Remove the frame-member bolts at the front left and front right corners of a Knurr DCM.
3. Position the front top cover cable management panel so the holes at each end align with the bolt holes.
4. Reinsert the bolts and tighten them.
5. Repeat **Steps 2** through **4** for the rear of rack.

Figure 19 Dress panels along edge of cluster of Knurr DCMs

Three-piece Top Cover Cable Management kits for racks within a row (front and rear panels, center cable management unit):

- 600 wide cabinet: **Part # 537876G1**
- 700 wide cabinet: **Part # 537887G1**
- 800 wide cabinet: **Part # 537877G1**

Two-piece Top Cover Cable Management kits for racks at the end of a row (side panels only):

- 1000 deep cabinet: **Part # 537878G1**
- 1100 deep cabinet: **Part # 537879G1**
- 1200 deep cabinet: **Part # 537880G1**

4.11.1 Internal Cable Management Troughs

Internal Cable Management Troughs may be installed to support wiring across short spans, such as when it must cross the width of the cabinet. The optional accessory mounts on the Knurr DCM's 19" rails as shown in **Figure 20**. Use spring nuts, washers and screws to mount trough to rails or to the aluminum frame members.

Figure 20 Internal cable trough installation

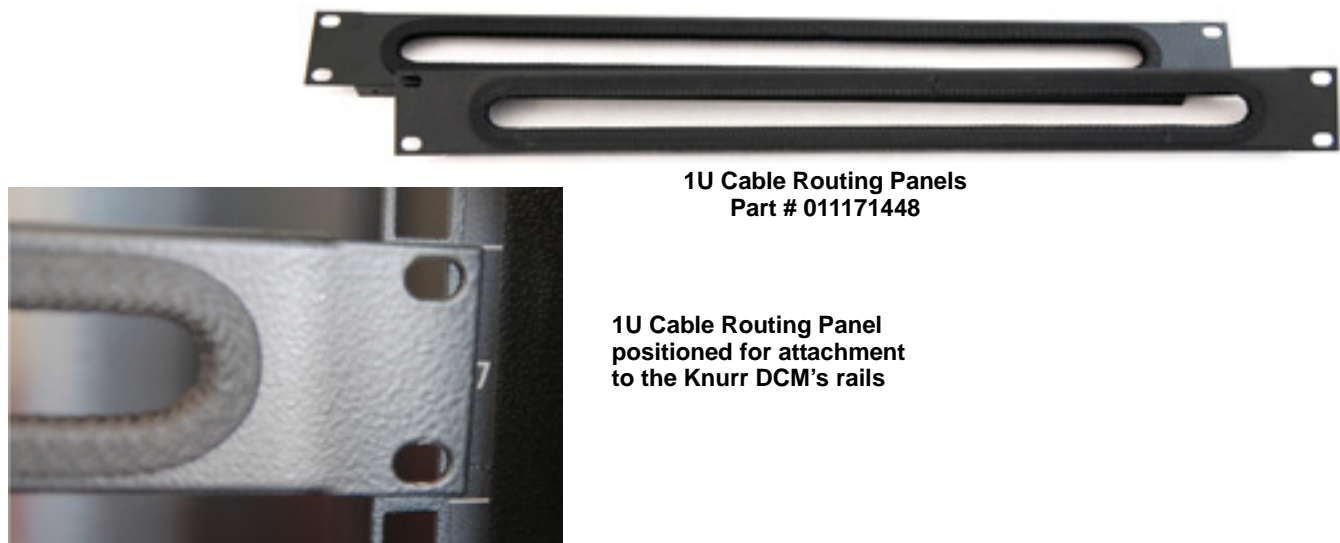


4.11.2 1U Cable Routing Panel

Cable Routing Panels (**Part # 011171448**) may be installed to separate cables and wiring to reduce clutter, to reduce chafing and to ease determining a cable's purpose, such as communication to a server. The optional accessory mounts on the Knurr DCM's rails, as shown in **Figure 21**. Insert cagenuts in rails where the radial limit will be installed, attach the routing panel and pull cables through the slot.

Routing panels may be installed to separate cables and wiring to reduce clutter and improve airflow. The optional accessory mounts on the Knurr DCM's rails, much like the cable routing panel. Insert cagenuts in rails where the routing panel will be installed, attach the routing panel and slip cables through the prongs.

Figure 21 1U Cable Routing Panel installation



4.12 Attach Cable Management Option—Cable Fingers

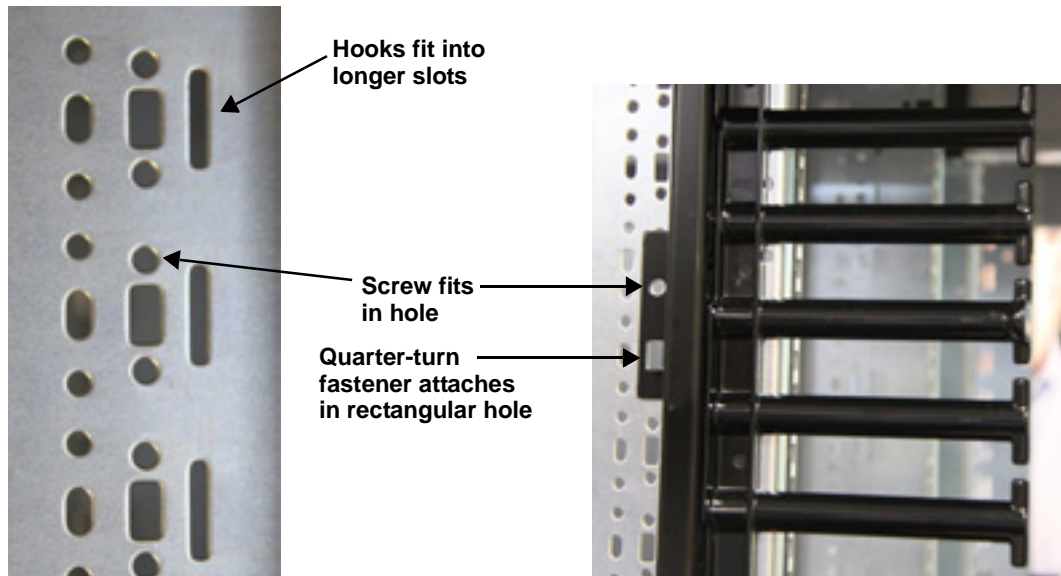
The Cable Fingers (**Part # 010200078**) option permits routing cables in the void between Knurr DCM racks in a cluster configuration. The cables can be strung through the fingers of the Cable Fingers and into an adjacent rack.

A Knurr DCM will accommodate two sets of the Cable Fingers installed one above the other in a 42U or 45U cabinet.

Hang the Cable Fingers on the rails by fitting the tabs into slots as shown in **Figure 22**. The uppermost tab on the Cable Fingers should be in the fourth slot from the top.

Cable Fingers should be hung on each rack for easier routing of cables into each.

Figure 22 Cluster cable routing components—assembled and installed

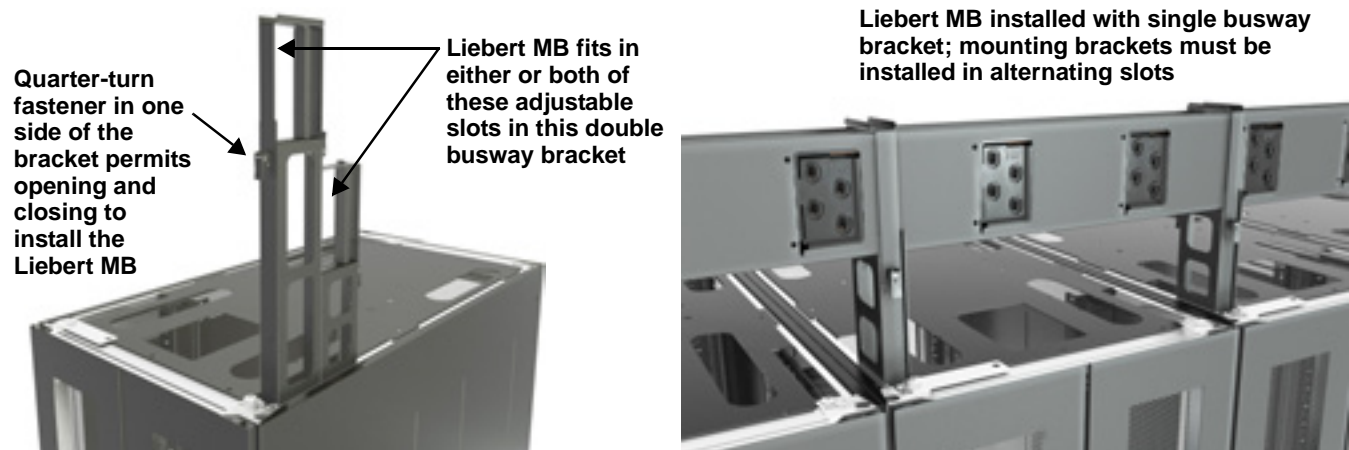


4.12.1 Install a Liebert MB Mounting Bracket

The Liebert MB mounting bracket is needed for installing a Liebert MB modular busway on a Knurr DCM. The Liebert MB provides power connections to multiple rack-mounted and room power distribution units, uninterruptible power systems and surge protection devices. The Knurr DCM cabinets must be aligned, but need not be attached in a cluster configuration. Refer to the Liebert MB user manual for details on installing the power supply system.

The mounting brackets attach at the rear of the Knurr DCM. One bracket must be installed in each Knurr DCM to hold the Liebert MB securely (see **Figure 23**).

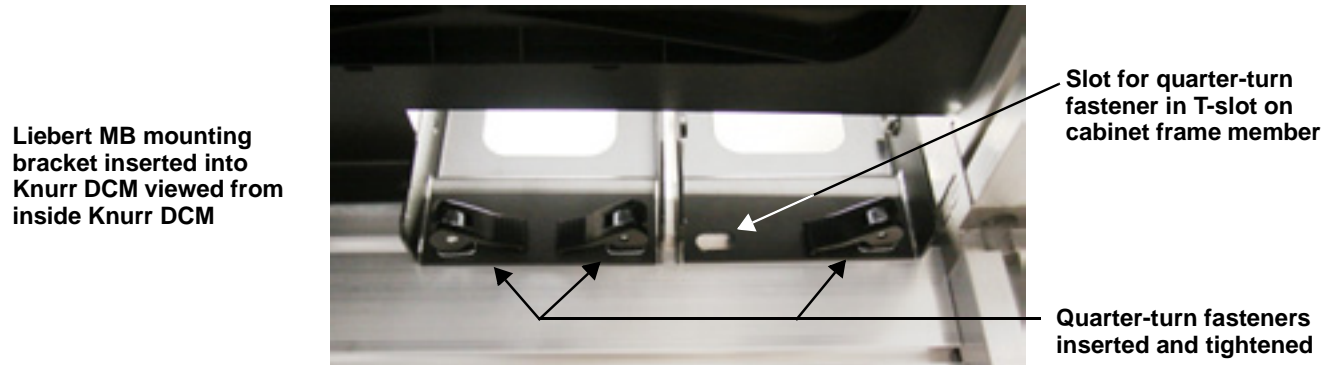
Figure 23 Liebert MB mounting brackets



To install Liebert MB mounting brackets on a row of Knurr DCM cabinets:

1. Insert the bottom of the mounting bracket through one of the two slots in the rear of the first Knurr DCM in the row.
2. Hold the bracket against the cabinet frame member and attach it with metal quarter-turn fasteners (see **Figure 24**)

Figure 24 Liebert MB mounting bracket inserted into Knurr DCM



5.0 MAINTENANCE

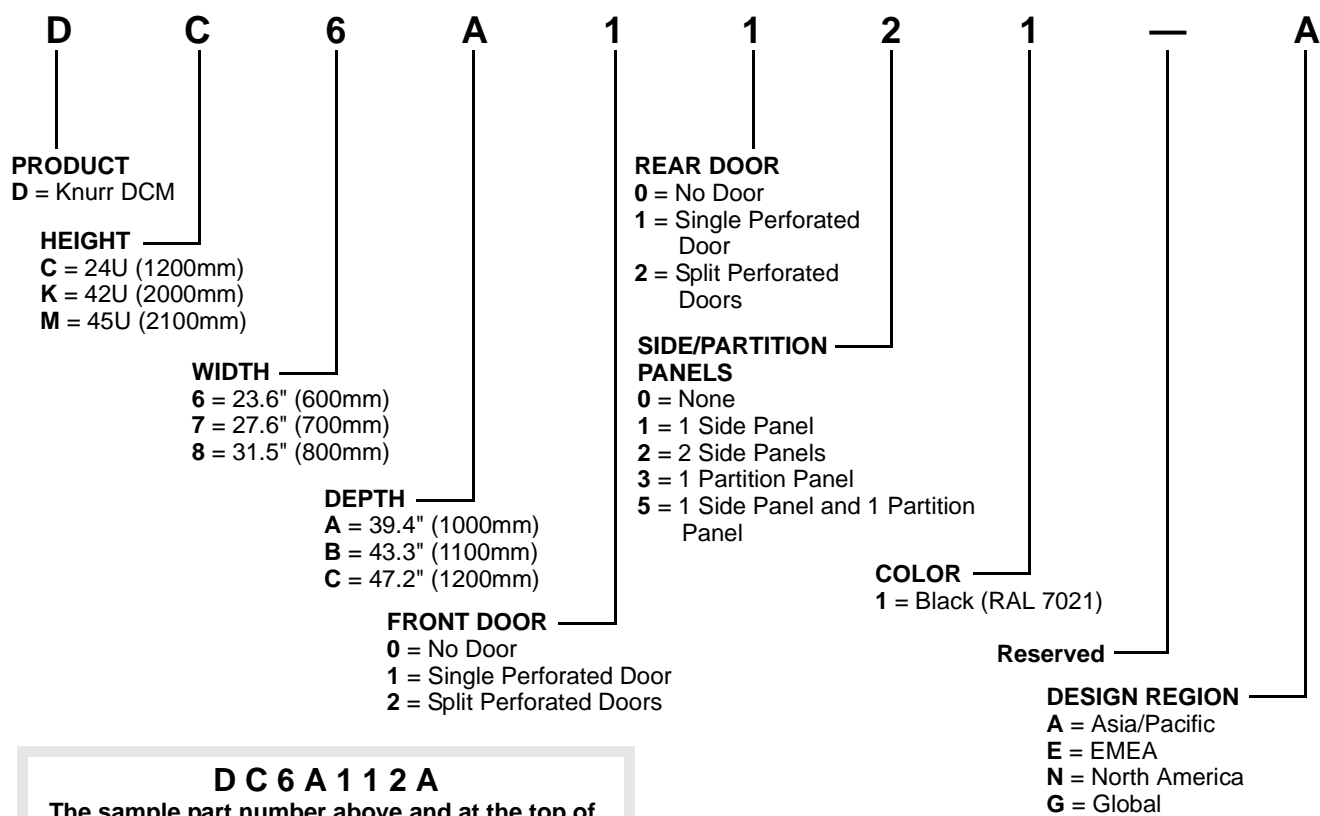
5.1 Periodic Maintenance

Your Knurr DCM cabinet requires no special maintenance. It should be cleaned periodically, more frequently if the air in the vicinity is not filtered for particulates.

Dust should be cleaned from installed equipment according to the manufacturer's recommendations. Clean the interior of the cabinet with a dry cloth.

6.0 SPECIFICATIONS

Figure 25 Knurr DCM model numbers



DC6A112A

The sample part number above and at the top of the page specifies a Knurr DCM with these characteristics:

- Height—24U (1200mm)
- Width—23.6" (600mm)
- Depth—39.4" (1000mm)
- Front Door—single, perforated
- Rear Door—single, perforated
- Side Panels—2
- Color—black
- Design Region—Asia/Pacific

Table 5 Knurr DCM quick-ship part numbers

Part #	Description
D4224442	42U x 24" W x 44" D With Side Panels
D4224440	42U x 24" W x 44" D No Side Panels
D4232442	42U x 32" W x 44" D With Side Panels
D4232440	42U x 32" W x 44" D No Side Panels

7.0 ACCESSORIES

Table 6 Accessories part numbers and descriptions

Part #	Description	On Page
D4224442	42Ux600x1100 Quick Ship Rack with Sides	28
D4224440	42Ux600x1100 Quick Ship Rack Without Sides	28
D4232442	42Ux800x1100 Quick Ship Rack with Sides	28
D4232440	42Ux800x1100 Quick Ship Rack Without Sides	28
035351081	24 NEMA 5-20r (T-slot) Receptacles, 30A L5-30 Locking Input, 10' Cord	
035352061	24 IEC C-13 Receptacles, 30A L6-30 Locking Input, 10' Cord	
002185050	Tool-Less Cable Management Lobster Claw (Pack of 10)	21
002185060	Tool-Less Cable Management Velcro Strip (Pack of 10)	21
002185070	Tool-Less Cable Management Lobster Claw (Pack of 100)	21
002185080	Tool-Less Cable Management Velcro Strip (Pack of 100)	21
010200064	One or Two Rack Solutions Populated with Rack PDU and UPS, Rack Size 42Ux600x1100	
538444G1L	24U 1200x600 Single Perforated Door	2
539273G1L	24U 1200x600 Split Perforated Doors	2
538444G2L	24U 1200x700 Single Perforated Door	2
539273G2L	24U 1200x700 Split Perforated Doors	2
538444G3L	24U 1200x800 Single Perforated Door	2
539273G3L	24U 1200x800 Split Perforated Doors	2
538444G4L	42U 2000x600 Single Perforated Door	2
539273G4L	42U 2000x600 Split Perforated Doors	2
538444G5L	42U 2000x700 Single Perforated Door	2
539273G5L	42U 2000x700 Split Perforated Doors	2
538444G6L	42U 2000x800 Single Perforated Door	2
539273G6L	42U 2000x800 Split Perforated Doors	2
538444G7L	45U 2100x600 Single Perforated Door	2
539273G7L	45U 2100x600 Split Perforated Door	2
538444G8L	45U 2100x700 Single Perforated Door	2
539273G8L	45U 2100x700 Split Perforated Door	2
538444G9L	45U 2100x800 Single Perforated Door	2
539273G9L	45U 2100x800 Split Perforated Doors	2
538521G1L	24U Sheet Steel Side Panel 1200mm H x 1000mm D	2, 12
538521G2L	24U Sheet Steel Side Panel 1200mm H x 1100mm D	2, 12
538521G3L	24U Sheet Steel Side Panel 1200mm H x 1200mm D	2, 12
538521G4L	42U Sheet Steel Side Panel 2000mm H x 1000mm D	2, 12
538521G5L	42U Sheet Steel Side Panel 2000mm H x 1100mm D	2, 12
538521G6L	42U Sheet Steel Side Panel 2000mm H x 1200mm D	2, 12
538521G7L	45U Sheet Steel Side Panel 2100mm H x 1000mm D	2, 12
538521G8L	45U Sheet Steel Side Panel 2100mm H x 1100mm D	2, 12
538521G9L	45U Sheet Steel Side Panel 2100mm H x 1200mm D	2, 12
539920G1L	42U Partition Panel 2000mm H x 1000mm D	2, 12
539920G3L	42U Partition Panel 2000mm H x 1100mm D	2, 12
539920G5L	42U Partition Panel 2000mm H x 1200mm D	2, 12
539920G7L	45U Partition Panel 2100mm H x 1000mm D	2, 12
539920G9L	45U Partition Panel 2100mm H x 1100mm D	2, 12
539920G11L	45U Partition Panel 2100mm H x 1200mm D	2, 12

Table 6 Accessories part numbers and descriptions (continued)

Part #	Description	On Page
539952G1L	42U x 700mm W Vertical Blanking Panel W/cut Outs 2000mm H, Two Pieces	
539957G1L	42U x 800mm W Vertical Blanking Panel w/Cutouts, 2000mm H, Two Pieces	
539961G1L	45U x 700mm W Vertical Blanking Panel w/Cutouts ,2100mm H, Two Pieces	
539962G1L	45U x 800mm W Vertical Blanking Panel w/Cutouts, 2100mm H, Two Pieces	
542306G1L	42U x 700mm W Vertical Blanking Panel Solid, 2000mm H, Two Pieces	
542332G1L	42U x 800mm W Vertical Blanking Panel Solid, 2000mm H, Two Pieces	
542339G1L	45U x 700mm W Vertical Blanking Panel Solid, 2100mm H, Two Pieces	
542340G1L	45U x 800mm W Vertical Blanking Panel Solid, 2100mm H, Two Pieces	
539486G1L	42U 2000mm Full Height PDU Mounting Bracket (4" wide)	17
542868G1L	42U 2000mm Adjustable Full Height PDU Mounting Bracket (4" wide)	17
542919G1L	42U 2000mm Inset Full Height PDU Mounting Bracket (4" wide)	17
540084G1L	42U 2000mm Full Height PDU Mounting Bracket (8" wide)	17
539487G1L	45U 2100mm Full Height PDU Mounting Bracket (4" wide)	17
542906G1L	45U 2100mm Adjustable Full Height PDU Mounting Bracket (4" wide)	17
543002G1L	45U 2100mm Inset Full Height PDUmounting Bracket (4" wide)	17
540085G1L	45U 2100mm Full Height PDU Mounting Bracket (8" wide)	17
539917G1L	Rh PDU Mounting Bracket for DCM Rail 700-800mm	
539918G1L	Lh PDU Mounting Bracket for DCM Rail 700-800mm	
163796G1L	Fan 1000l Low Noise	
163796G3L	Fan 1000h High Ambient	
539991G1L	24U DCM EIA Server Rail Kit for 1200mm H - Two Pieces	
539814G1L	42U DCM EIA Server Rail Kit for 2000mm H - Two Pieces	
539818G1L	45U DCM EIA Server Rail Kit for 2100mm H - Two Pieces	
538569G1	Hardware to Mount Components on EIA Rail 50 Each M5 Cagenuts, Screws and Rosette Washers	
002185000	1U Fixed Tool-Less Shelf, 150lb. (68kg) Load Rating	14
011139278	2U Locking Drawer	15
535809G1	1U Telescopic Shelf, 110lb. (50kg) Load Rating	14
542777G1	"L" Shaped Depth Adjustable Support Rail, Two-Piece Kit	8
010200087	1U Tool-Less Plastic Blanking Panel, Box of 10	19
010200088	2U Tool-LessTool-Less Plastic Blanking Panel, Box of Five	19
540785G1L	Air Diverter for IT Switch, 4U	
540785G2L	Air Diverter for IT Switch, 12U	
540785G3L	Air Diverter for IT Switch, 15U	
010200085	Low-Profile Quarter-Turn Plastic Mechanical Fastener, Bag of 10	
010200086	High-Profile Quarter-Turn Plastic Mechanical Fastener, Bag of 10	
536650G1	Metal, Quarter-Turn Mechanical Fastener, Bag of 10	
540536G1L	Kit of One Mounting Bracket to Secure A and B Busway to Knurr DCM Frame; Use One for Every 5' of Cabinet Run	
538619G1L	Kit RPC BDM Bracket to Mount the RPC BDM on the Perforated Door	
541100G1L	Kit RPC BDM Bracket to Mount the RPC BDM on T-Slot on Knurr Rack	
013504059	Kit of 50 Pieces M6 Spring Nut	
540254G1L	Anti-Tilt System, One Set of Two Deployable Legs	13
539994G1	Set of Two Horizontal Caster Brackets with Integrated Leveling Feet for 600mm wide	
539996G1	Set of Two Horizontal Caster Brackets with Integrated Leveling Feet for 700mm wide	
539997G1	Set of Two Horizontal Caster Brackets with Integrated Leveling Feet for 800mm wide	

Table 6 Accessories part numbers and descriptions (continued)

Part #	Description	On Page
011309347	Kit of Four Anchor Kits to Secure Cabinet to Raised Floor	
540275G1L	Lock Insert Kit of Two Lock Inserts and Four Keys	
000784649	Handle	
011399067L	Side Panel Lock Set, Contains One Side Panel Lock and Two Keys	2
539608G1	24U Tool-Less Cluster Kit	20
539608G2	42U Tool-Less Cluster Kit	20
539608G3	45U Tool-Less Cluster Kit	20
011171448	1U 19" Mount Cable Routing Panel with D Rings	21
011170208	1U 19' Mount Cable Routing Panel, Allows Cable to Pass Through Front to Rear	21
050400558	19" Cable Trough, Internal	24
537876G1	Top Cover Based Cable Routing Kit for 600mm W Cabinet, Includes Front and Rear Trim Pieces	22
537887G1	Top Cover Based Cable Routing Kit for 700mm W Cabinet, Includes Front and Rear Trim Pieces	22
537877G1	Top Cover Based Cable Routing Kit for 800mm W Cabinet, Includes Front and Rear Trim Pieces	22
537878G1	Kit of Two Trim Pieces for Top Cover Based Cable Management, 1000mm D Cabinet	22
537879G1	Kit of Two Trim Pieces for Top Cover Based Cable Management, 1100mm D Cabinet	22
537880G1	Kit of Two Trim Pieces for Top Cover Based Cable Management, 1200mm D Cabinet	22
010200078	Kit of Two 18U Vertical Fingers Includes Hardware and Mounting Instructions	21, 25
542665G1	Tool Kit, Contains One M5 Allen Wrench, One M6 Allen Wrench, One Torx L Key, T30	4

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